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December 17, 2002 (11:39AM)

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3. (Twice Amended) The method of Claim 29, wherein said depositing step comprises chemical vapor deposition.

8. (Twice Amended) The method of Claim 29, wherein said boron carbide layer comprises  $B_4C$ .

9. (Twice Amended) The method of Claim 29, wherein said boron carbide layer comprises particles of  $B_4C$ .

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10. (Twice Amended) The method of Claim 29, wherein said boron carbide layer comprises a composition between  $B_4C$  and  $B_{13}C_3$ .

11. (Twice Amended) The method of Claim 29, wherein said boron carbide layer comprises between 14 to 30 wt% of carbon relative to a total weight of carbon and boron.

12. (Already Amended) The structure of Claim 11, wherein said boron carbide layer comprises between 18 to 25 wt% of carbon relative to a total weight of carbon and boron.

13. (Twice Amended) A method of forming a boron carbide layer on an aluminum-based substrate, comprising:

forming an anodization layer in a first portion of a surface of an aluminum-based substrate, a second portion of said surface being free of said anodization layer; and  
then depositing a boron carbide layer upon said first and second portions of said surface including at least a portion of said anodization layer.

14. (Already Amended) The method of Claim 13, wherein said depositing step comprises thermal spraying.

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15. (Already Amended) The method of Claim 13, wherein said depositing step comprises chemical vapor deposition.

16. (Twice Amended) The method of Claim 13, further comprising the step, performed prior to said step of forming said anodization layer, of roughening at least a third portion of said surface of said aluminum-based substrate and wherein said step of forming said anodization layer anodizes said third portion and said depositing step deposits said boron carbide layer on said anodization layer overlying said anodized third portion.

17. (Thrice Amended) A method of forming a boron carbide layer on an aluminum-based substrate, comprising:

an initial step of roughening at least a first portion of a surface of an aluminum-based substrate;

anodizing said surface of said aluminum-based substrate to form an anodization layer, wherein said anodizing step anodizes said first portion;

removing said anodization layer from a second portion of said substrate adjacent to said first portion and separated therefrom by a predetermined boundary, said roughened first portion extending below a portion of said anodization left by said removing step; and

then depositing a boron carbide layer upon said anodization layer, wherein said depositing step deposits said boron carbide layer on said anodization layer overlying said anodized first portion.

18. (Already Amended) The method of Claim 16, wherein a material of said substrate is selected from the group consisting of aluminum and aluminum alloys.

19. (Already Amended) The method of Claim 16, wherein said boron carbide layer comprises B<sub>4</sub>C.

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20. (Already Amended) The method of Claim 16, wherein said boron carbide layer comprises particles of  $B_4C$ .

21. (Already Amended) The method of Claim 16, wherein said boron carbide layer comprises a composition between  $B_4C$  and  $B_{13}C_3$ .

22. (Already Amended) The method of Claim 16, wherein said boron carbide layer comprises between 14 to 30 wt% of carbon relative to a total weight of carbon and boron.

23. (Already Amended) The structure of Claim 22, wherein said boron carbide layer comprises between 18 to 25 wt% of carbon relative to a total weight of carbon and boron.

28. (Twice Amended) The structure of Claim 29, wherein said roughening step is performed before said anodizing step.

29. (Twice Amended) A method of coating boron carbide on an aluminum-based substrate, comprising the steps of:

roughening a surface of a substrate to a value of surface finish  $R_a$  of at least  $2.5\mu m$ , wherein said substrate is composed of an aluminum-based material selected from the group consisting of substantially pure aluminum and aluminum alloys including at least 90 wt% elemental aluminum;

anodizing said substrate to form an anodization layer;

removing said anodization layer from only a first portion and not from a second portion of said surface of said substrate; and

depositing a boron carbide layer upon said anodization layer, wherein said boron carbide layer is deposited on both said first and second portions after said removing step.

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30. (Already Amended) The process of Claim 17, wherein said boron carbide layer is deposited onto said anodized first portion and second portion of said substrate.

31. (Amended) A method of forming a boron carbide layer on an aluminum-based substrate, comprising:

an initial step of anodizing a surface of an aluminum-based substrate to form an anodization layer;

then removing said anodization layer from a first portion of said substrate separated by a predetermined boundary from a second portion of said substrate from which said anodization layer is not removed; and

then depositing a boron carbide layer upon said anodization layer, wherein said depositing step deposits said boron carbide layer in a layer extending over said first portion of said substrate and across said boundary to a neighboring part of said second portion of said substrate.

32. (Amended) The process of Claim 13, further comprising the step performed prior to said step of forming said anodization layer of roughening a third portion of said substrate including a first part of said first portion of said substrate and extending across a boundary to a neighboring part of said second portion of said substrate.

33. (Amended) The process of Claim 32, wherein a further part of said first portion of said substrate is not roughened and wherein said depositing step deposits said boron carbide layer over said further part and at least a portion of said first part.